

WHAT IS CLAIMED AS NEW AND DESIRED TO BE SECURED BY LETTERS
PATENT OF THE UNITED STATES IS:

1. A laminated glazing material with properties of acoustic insulation and mechanical strength, said glazing material comprising two glass sheets and a single-ply intermediate layer in the form of a polymeric film and having a thickness, wherein the thickness of the intermediate layer is equal to at least $d_{ref} J_{ref}/J_c$, where:

J_c is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer;

J_{ref} is a reference critical energy value which corresponds to a critical energy value of a polyvinyl butyral (PVB) film and is equal to $35,100 \text{ J/m}^2$ for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film; and

d_{ref} is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm .

2. The laminated glazing material according to Claim 1, wherein the intermediate layer satisfies acoustic property criteria defined by a bar of 9 cm length and 3 cm width, made of laminated glass comprising two glass sheets of 4 mm thickness joined by the intermediate layer having a thickness of 2 mm , has a critical frequency which differs at most by 35% from that of a glass bar having a same length, a same width and a thickness of 4 mm .

3. The laminated glazing material according to Claim 1, wherein the intermediate layer has a loss factor greater than 0.6 and a shear modulus of between 1×10^8 and $2 \times 10^7 \text{ N/m}^2$ in a temperature range of between 10 and 60°C and in a frequency range of between 50 and $10,000 \text{ Hz}$.

4. A laminated glazing material with properties of acoustic insulation and mechanical

strength, said laminated glazing material comprising two glass sheets and a single-ply intermediate layer, wherein the intermediate layer is made of a composite material, said composite material comprising a polymer and reinforcing fibers embedded in the polymer.

5. The laminated glazing material according to Claim 4, wherein the intermediate layer satisfies acoustic property criteria defined by a bar of 9 cm length and 3 cm width, made of laminated glass comprising two glass sheets of 4 mm thickness joined by the intermediate layer having a thickness of 2 mm, has a critical frequency which differs at most by 35% from that of a glass bar having a same length, a same width and a thickness of 4 mm.

6. The laminated glazing material according to Claim 4, wherein the intermediate layer has a loss factor greater than 0.6 and a shear modulus of between 1×10^8 and 2×10^7 N/m² in a temperature range of between 10 and 60°C and in a frequency range of between 50 and 10,000 Hz.

7. A polymer film having a thickness for use as an intermediate layer of a laminated glazing material, wherein the thickness is equal to at least $d_{\text{ref}} J_{\text{ref}}/J_c$, where:

J_c is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer;

J_{ref} is a reference critical energy value which corresponds to the critical energy value of a polyvinyl butyral (PVB) film and is equal to 35,100 J/m² for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film; and

d_{ref} is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm.

8. A polymer film for use as an intermediate layer of a laminated glazing material, wherein the polymer film is a composite comprising a polymer and reinforcing fibers

embedded in the polymer.

9. A process for evaluating a tearing strength of a polymer film of thickness d_1 , for use as an intermediate layer of a laminated glazing material, said process comprising the steps of:

determining a critical energy value J_c of the intermediate layer, the critical energy value representing an energy necessary for propagation of a crack initiated in the intermediate layer;

calculating a critical energy value \tilde{J}_c relative to the thickness using a relationship $\tilde{J}_c = J_c d_1$;

comparing \tilde{J}_c with a reference value \tilde{J}_{ref} , representative of a polyvinyl butyral film of 0.38 mm thickness and equal to 13.3 J/m; and

determining when the intermediate layer satisfies a tearing strength criterion when

$$\tilde{J}_c > \tilde{J}_{ref}.$$